

EXHIBIT 6

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**IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION**

JEFF YOUNG, individually and on behalf of) Case No. 4:17-cv-06252-YGR
all others similarly situated,)
)
Plaintiff,)
)
v.)
)
CREE, INC.,)
)
Defendant.)

)

REVISED¹ EXPERT REPORT OF JESSE DAVID, PH.D.

I. ASSIGNMENT

1. Named Plaintiff in this action, Jeff Young, has accused Defendant Cree, Inc. (“Cree”) of selling products with false and/or misleading information on the product packaging.² Plaintiff alleges that claims made on the labels of various types of Cree’s light-emitting diode (“LED”) lightbulbs (the “Accused Products”) “overpromise the longevity of the Lightbulbs” and that “the various lifetime savings estimations asserted by Defendant in its advertising are illusory and incorrect.”³ Plaintiff also alleges that claims made in Cree’s product labels indicating a “10-Year Warranty” and a “100% Satisfaction Guarantee” are false and/or misleading.⁴ I refer to the label statements accused by Plaintiff collectively as the “Accused Claims.”

¹ The revisions to this report consist solely of corrections to Bates labels in citations.

² Amended Class Action Complaint, April 30, 2018 (“Complaint”).

³ Complaint, ¶¶19-31.

⁴ Complaint, ¶30.

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2. Plaintiff seeks to represent a class of consumers described as, “[a]ll persons in California who purchased the LED Lightbulbs for end use, and not resale, during the period from March 2013 to the present.”⁵ Plaintiff alleges that Cree’s actions caused “economic loss”—i.e., damages—to members of the putative class in the form of “a price premium for the Cree LED bulbs that they would not have paid absent the false marketing representations.”⁶ Plaintiff has filed an expert report on damages, prepared by Stefan Boedeker.⁷ In his report, Mr. Boedeker describes a consumer survey which he designed and implemented to “quantify the economic loss to consumers if they were given the information at the point of purchase that Defendant’s Accused Claims were false and misleading” and to “calculate class-wide damages if the disclosure that Defendant’s Products are not as represented.”⁸ Referring to Mr. Boedeker’s report, Plaintiff claims damages to be “nearly 48-60% of the purchase price Class members paid for the LED lightbulbs.”⁹

3. I have been asked by counsel for Cree to review and respond to certain claims in Plaintiff’s filings, including the report prepared by Mr. Boedeker. My report, which follows, is based on my professional training and experience and my review and analysis of information produced in the course of this litigation as well as public information. The materials reviewed by myself and my staff and which I have considered in the preparation of my opinions are listed in Appendix 1.¹⁰ I reserve the right to revise my opinions if additional information is provided to me—including but not limited to any expert reports, deposition testimony and exhibits, pretrial briefs, trial testimony, etc.—or if additional research, reflection, or the correction of inadvertent errors leads me to change my opinion. I may rely on visual aids and demonstrative exhibits that demonstrate the bases of my opinions. I have not yet prepared any

⁵ Plaintiff’s Memorandum of Law in Support of Motion for Class Certification, January 18, 2019 (“Class Motion”), p. 1.

⁶ Complaint, ¶9; and Class Motion, pp. 19-20.

⁷ Expert Report of Stefan Boedeker in Support of Plaintiff’s Motion for Class Certification, January 18, 2019 (“Boedeker Report”).

⁸ Boedeker Report, pp. 6-7.

⁹ Class Motion, p. 1; and Boedeker Report, pp. 72-73.

¹⁰ I also conducted an interview of Scott Schwab, currently Cree’s Vice President and General Manager, Lamps.

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exhibits for use at trial as a summary or support for opinions expressed in this report, but I expect to do so in accordance with the Court's scheduling orders.

II. QUALIFICATIONS

4. I am an economist and President of Edgeworth Economics, L.L.C. ("Edgeworth"). Edgeworth is a consulting firm that provides economic and financial analysis for complex litigation and public policy matters. Prior to founding Edgeworth with a group of economists in 2009, I was Senior Vice President at Criterion Economics and, before that, a Vice President at National Economics Research Associates, where, for approximately a dozen years, I performed economic analysis for a range of litigation, strategy, and public policy matters.

5. I hold a Bachelor's degree in Physics and Economics from Brandeis University and a Ph.D. in Economics from Stanford University. Throughout my professional career, I have specialized in applied microeconomics and econometrics (the application of statistics to economic problems), as well as economic sub-fields related to regulation, antitrust, and intellectual property. My practice has focused on complex valuation matters, analysis of markets and regulations, and assessing damages in a variety of types of civil disputes, including those related to infringement of various forms of intellectual property—such as patents, trademarks, and copyrights—as well as cases involving claims of false advertising. In some instances, my research has been incorporated in public speeches, published writings, and expert testimony. I have testified as an expert witness in deposition and at hearings or trials on approximately 60 occasions. My curriculum vitae, which includes lists of my previous testimony, publications, and public presentations, is attached as Appendix 2.

6. Edgeworth's fees for professional services are based on hourly billing rates. My time is currently billed at \$625 per hour and my firm's compensation does not depend on the outcome of this case.

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III. BACKGROUND

A. Cree

7. Cree is a public company, headquartered in North Carolina, which manufactures and distributes a variety of electronic products.¹¹ One of Cree's product lines is LED lightbulbs. Cree's website currently lists several dozen models of LED lightbulbs, which differ by wattage, size and shape, light type (e.g., "soft white"), and other features.¹² Cree introduced these products in March 2013.¹³ Cree's primary (and formerly exclusive) retail outlet in the U.S. is The Home Depot.¹⁴

8. LED lightbulbs are lightbulbs powered by an LED chip. Cree's lightbulbs are designed to reduce energy consumption and last longer than traditional incandescent lightbulbs, and to offer similar light characteristics and fit appliances designed for traditional bulbs.¹⁵ Figure 1 shows a version of the label from a package for one of Cree's LED lightbulbs as of 2013.

¹¹ Cree 2018 Annual Report, p. 5.

¹² Cree website, creebulb.com.

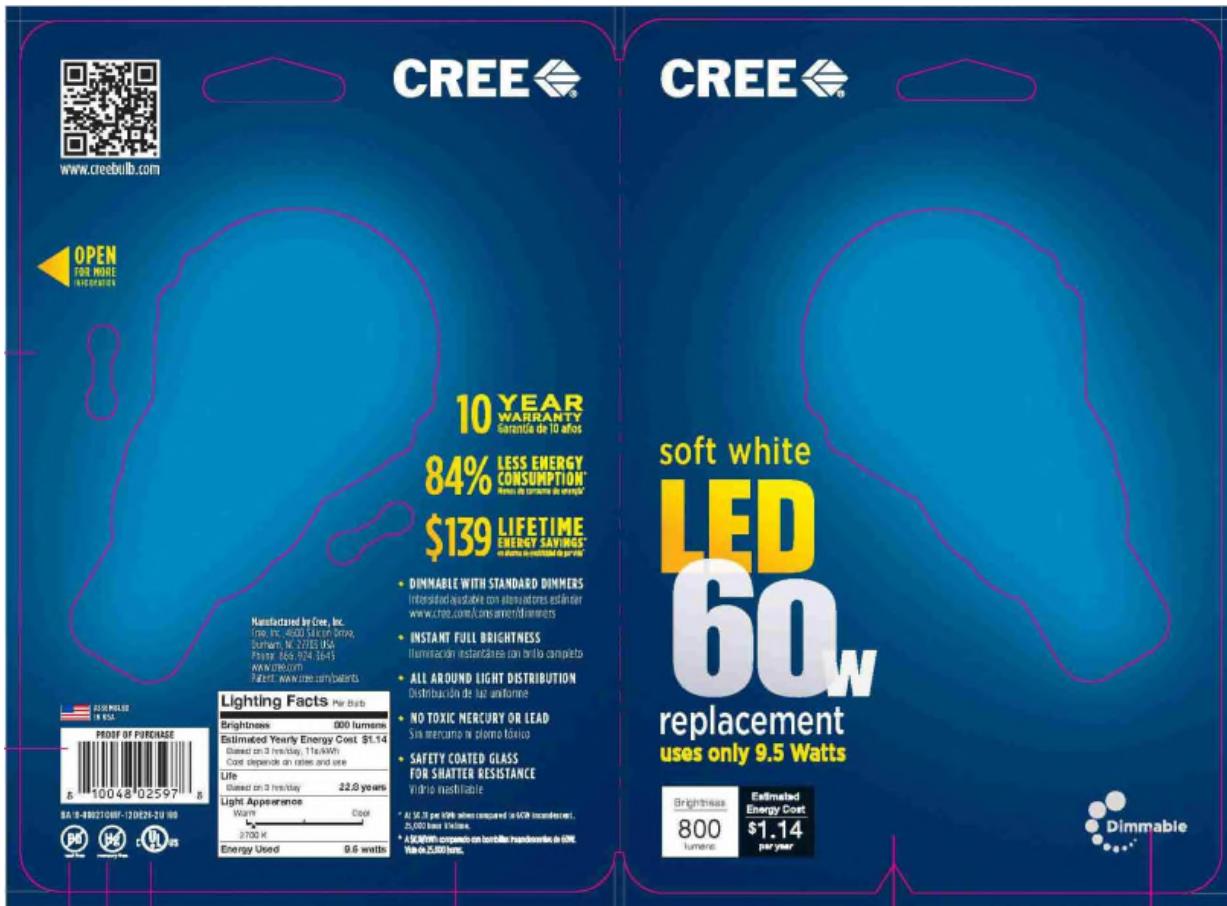
¹³ Deposition of Scott Schwab, January 4, 2019 ("Schwab Deposition"), p. 13.

¹⁴ Schwab Deposition, pp. 26-27.

¹⁵ Cree website, creebulb.com/products and creebulb.com/40-watt-replacement-soft-white.

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Figure 1
CREE LED Lightbulb Label, 60-Watt Replacement, June 2013



Source: CREE_00064720.

9. As seen in Figure 1, Cree includes on the package label a variety of descriptions and claims related to the performance of the products. According to the Court, those claims can be grouped into four categories:

- 1) information that the manufacturer is required to disclose under the Energy Policy and Conservation Act (“EPCA”) and which is contained in the “Lighting Facts” box (the white box in Figure 1 with “Lighting Facts” at the top) and the “Principal Panel

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Display” (the black and white boxes with information about “brightness” and “estimated energy cost”);¹⁶

- 2) reiterations elsewhere on the label of information from the EPCA disclosures or other claims based on applying mathematical calculations to those disclosures—for example, a claim of “27+ years rated lifetime,” which is not present in the label shown in Figure 1 but which was present on other packages;¹⁷
- 3) information about comparisons of the product’s performance to the performance of other products—for example, the claim shown in Figure 1 of “84% less energy consumption...At \$0.11 per kWh when compared to 60W incandescent”;¹⁸ and
- 4) claims related to Cree’s warranty—for example, the claim of “10 year warranty” shown in Figure 1 or the claim of “100% Satisfaction Guaranteed” (with additional disclaimers), which is not present in the label shown in Figure 1 but which has been contained in other product labels.¹⁹

B. Plaintiff’s Allegations

10. Plaintiff claims to have purchased three 100W Cree lightbulbs in 2015 for “approximately \$15-20” each.²⁰ He further alleges that all three of the lightbulbs “burned out within 6 months to a year” and that he subsequently contacted Cree but “never received a meaningful response.”²¹

11. Plaintiff alleges that Cree’s label contains false and/or misleading claims including “promises of longevity as compared to the competitor lightbulbs, which allegedly results in

¹⁶ Order Re: Motion to Dismiss, April 9, 2018 (“April 2018 Order”), pp. 5-7; and U.S. Federal Trade Commission website, www.ftc.gov/tips-advice/business-center/guidance/ftc-lighting-facts-label-questions-answers-manufacturers. The Court’s Order described three categories of information on the labels of the Accused Products in addition to the information required by the EPCA.

¹⁷ April 2018 Order, pp. 7-9; and Boedeker Report, p. 4.

¹⁸ April 2018 Order, pp. 9-10.

¹⁹ April 2018 Order, pp. 7-8 and 10; and Boedeker Report, p. 4.

²⁰ Class Motion, p. 6.

²¹ Class Motion, p. 6.

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energy and cost savings, with a performance warranty.”²² Plaintiff further alleges that the Accused Claims “allow Cree to command a premium price for the Bulbs.”²³

12. In his Class Motion, Plaintiff asserts that Cree “overpromises the longevity of the Lightbulbs” and that the factual question regarding the actual “lifetime of the bulbs” compared the longevity “promised” by Cree can be determined later using “common evidence.”²⁴ Citing Mr. Boedeker’s report, Plaintiff asserts that “each purchaser who bought the LED bulbs with the false longevity claims overpaid by 60.2% of the purchase price for 60W replacement bulbs and 47.6% of the purchase price for 100W bulbs.”²⁵

13. I understand that the Court has dismissed Plaintiff’s claims to the extent that they relate to label descriptions in either of the first two categories listed above.²⁶ Thus, Cree’s label claims in the Lighting Facts box or claims elsewhere on the label that are identical to or substantially similar to those claims (such as an estimate of lifetime in hours that is an arithmetic conversion from the annual estimate in the Lighting Facts box) cannot result in a finding of liability against Cree.

14. I also understand that it is widely accepted, including by Plaintiff’s expert, that “LED light bulbs generally require about 18% of the energy required by an incandescent light bulb with the same light output, measured in lumens.”²⁷ In his Class Motion and Complaint, Plaintiff does not allege that descriptions on the labels of the Accused Products asserting energy savings relative to incandescent lightbulbs in percentage terms are false or misleading.

C. The Boedeker Report

15. In his report, Mr. Boedeker terms the claims accused by Plaintiff the “Longevity Claims” and describes them as follows:²⁸

²² Class Motion, p. 1.

²³ Class Motion, p. 1.

²⁴ Class Motion, pp. 5-6.

²⁵ Class Motion, p. 5.

²⁶ April 2018 Order, pp. 6-9.

²⁷ Boedeker Report, p. 5. See also, U.S. Department of Energy website, www.energy.gov/energysaver/save-electricity-and-fuel/lighting-choices-save-you-money/how-energy-efficient-light.

²⁸ Boedeker Report, p. 3.

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Collectively, the claims with regard to lifespan comparison to incandescent lightbulbs, that Defendant's LED bulbs will last “up to 3x as long as the cheap LED bulbs,” and the “Satisfaction Guarantee” warranty claims alleged to be false and/or misleading...

Notably, Mr. Boedeker does not include the label statements about specific lifetime estimates such as “27+ years rated lifetime.”

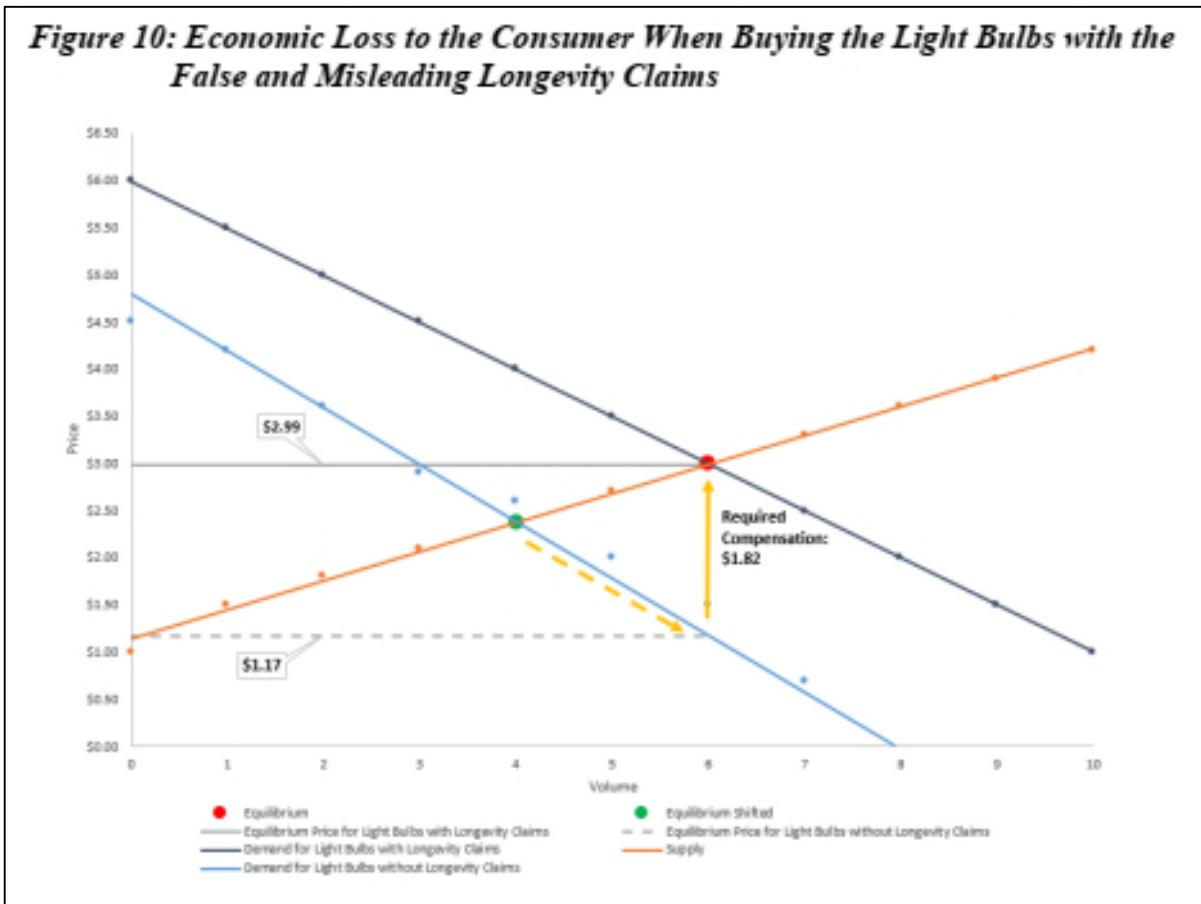
16. Mr. Boedeker then provides opinions related to the alleged damages that fall generally into three categories:

- 1) Mr. Boedeker first proposes a theoretical “economic loss model” for class-wide damages based on the difference between consumer demand for the Accused Products as actually sold relative to consumer demand for the same products if they had been sold without the “Longevity Claims” (the “but-for” scenario).²⁹ Mr. Boedeker proposes to measure the reduction in retail price that would have been necessary to induce the same number of consumers to purchase the Accused Products without the “Longevity Claims” on the labels as actually purchased them with those claims on the labels. He defines that reduction in price as the “economic loss,” which would be applied to all members of the putative class. Figure 2 is a reproduction of the stylized example presented by Mr. Boedeker to demonstrate his approach. As shown here, Mr. Boedeker proposes to estimate the difference between the actual demand curve for the Accused Products and the “but-for” demand curve, measured at the quantity of actual consumption.

²⁹ Boedeker Report, pp. 7-20.

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Figure 2
Mr. Boedeker's Proposed Framework for Classwide Damages



Source: Boedeker Report, Figure 10.

2) Mr. Boedeker then reports the results of a conjoint survey in which he elicited respondents' preferences for hypothetical LED lightbulb products with a variety of features.³⁰ The features that he described to survey respondents and/or included as options in the survey itself are:³¹

- descriptions of physical characteristics of the lightbulbs, including wattage, light color, shape, socket type, dimmability, and indoor/outdoor;

³⁰ Boedeker Report, pp. 30-67.

³¹ Boedeker Report, pp. 58-59 and supporting document "LED Conjoint Survey.docx". The survey provided some additional description of these features to respondents who selected to obtain it. [Boedeker Report, pp. 59-60]

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- a statement of a “comparison to cheap LED lightbulbs,” which was either a) “no claim” or b) “the LED light bulb will last six times longer than cheap LED light bulbs”;
- a statement related to the warranty, which was one of a) “standard 90-day warranty, redeemable at retailer”; b) “10-year 100% satisfaction guarantee, redeemable at retailer”; or c) “10 years with original receipt and packaging, have to pay for shipment”; and
- a statement of lifetime with estimated savings relative to incandescent bulbs, which was one of a) “lasts 4+ years (5,000 hours), with estimated lifetime savings of \$27.50 over incandescent bulbs”; b) “lasts 13+ years (15,000 hours), with estimated lifetime savings of \$82.50 over incandescent bulbs”; c) “lasts 22+ years (25,000 hours), with estimated lifetime savings of \$137.50 over incandescent bulbs”; or d) “lasts 31+ years (35,000 hours) with estimated lifetime savings of \$192.50 over incandescent bulbs.”

Mr. Boedeker presents his results in terms of the “part-worths” for each attribute.³² Part-worths are calculated by the survey software (Sawtooth) and represent estimates of the relative importance of each attribute as components of the respondents’ overall utility of the hypothetical products.³³

- 3) Finally, Mr. Boedeker performs “market simulations” using the part-worth estimates.³⁴ The results of these simulations are estimates of the shares of survey respondents who would purchase hypothetical products at different price points with and without certain attributes. Mr. Boedeker terms the differences in willingness to pay for otherwise identical products with and without the “Longevity Claims” as the “economic loss” associated with Plaintiff’s claims. In his conclusion section, Mr. Boedeker presents the median and range of estimates of his “economic loss” based on differences in willingness to pay for hypothetical products with two versions of his “warranty” feature

³² Boedeker Report, pp. 65-67.

³³ Bryan K. Orme, Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research, 3rd ed., Manhattan Beach, CA: Research Publishers LLC, 2014, pp. 26-27.

³⁴ Boedeker Report, pp. 70-76.

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(options b and c, listed above) and then separately for two versions of his “lifetime” feature (options a and d, listed above). The latter serves as the basis for Plaintiff’s claim for damages in his Class Motion, cited above.

IV. DAMAGES FRAMEWORK

17. I understand that, in order for a class to be certified, the plaintiff must present a method for computing damages for each member of the putative class that relies on common, as opposed to individualized, evidence. I further understand that, at the class-certification stage, the plaintiff must provide a reliable damages model that specifically measures only the damages attributable to the plaintiff’s particular theory of liability.

18. I understand that a consumer’s damages due to misrepresentations by a manufacturer or seller of a product are equal to the difference between the consumer’s actual financial circumstances and her financial circumstances in a hypothetical scenario in which the misrepresentations did not occur (the “but-for” world)—i.e., a hypothetical scenario in which the manufacturer changes the descriptions of the product to be true and non-misleading.³⁵ These damages also can be described as the difference between the price paid by the consumer and the actual value received. This approach satisfies the notion of a “make-whole” damages award by placing the consumer in the financial position she would have held had the allegedly unlawful conduct not occurred.

19. In some cases, the actual prices paid by consumers may be observable from receipts, point-of-sale records, or other sources. Depending on the circumstances, however, such records may not exist or may be difficult to obtain. Thus, it may not be possible to observe actual prices using common evidence. Nevertheless, assuming that price information is available, the next question becomes: What is the actual value of the product as received? The only economically objective measure of “value” in this context is market value—i.e., the price that would have prevailed in the marketplace had the defendant not made the misrepresentations at issue. Thus, in a class action related to marketing claims, if the misrepresentations caused retail prices to be higher than what they otherwise would have been,

³⁵ See, for example, Federal Judicial Center, Reference Manual on Scientific Evidence, 3rd ed., Washington, D.C.: National Academies Press, 2011, pp. 432-443.

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then damages for a particular class member who would continue to purchase the product in the “but-for” world would equal the difference between the price she actually paid for the product and the price that would have prevailed in the “but-for” world. This difference can be described as a “price premium.”

20. Another possibility is that the misrepresentations caused some consumers to purchase the product who otherwise would not have done so, and therefore caused the quantity of the product sold to be greater than it otherwise would have been, but caused no impact on retail prices. In such a scenario, calculating damages would require an entirely different approach, as there would be two distinct groups of consumers: 1) those who would have purchased the product at the same price in the “but-for” world (and therefore suffered no damages); and 2) those who would have purchased some other product or no product in the “but-for” world. Consumers in the latter group may have experienced damages related to the costs and benefits of their alternative choices compared to their actual purchases. Measuring such damages therefore would require an inquiry into the availability, characteristics, and prices of other potential choices as well as the particular consumer’s preferences. Depending on the seller’s business strategy, it is also possible that the “but-for” world could involve some combination of lower prices and lower quantities. Again, that scenario would require a different damages approach for different consumers, depending on whether their purchasing behavior would have been different in the “but-for” world relative to the actual world.

21. To the extent that competitors’ strategies would differ in the “but-for” scenario relative to the actual scenario, that also should be considered in the analysis. For example, if, in the “but-for” scenario, the competitors of the accused product would lower their prices in response to any price reduction for the accused product, then the analysis of consumer response should account for those changes, as well.

22. In summary, calculating class-wide damages in a matter involving claims of misrepresentations on a product package requires a determination of the market price and quantity of the product if sold with only true and non-misleading claims on the package. That assessment requires an evaluation of both supply- and demand-side considerations, including: 1) the alternative labeling strategy of the seller; 2) the pricing strategy of the seller given the

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alternative label; 3) the reactions of competitors to those changes; and 4) consumers' responses to those strategies.

V. MR. BOEDEKER'S FRAMEWORK FOR ECONOMIC DAMAGES DOES NOT ADDRESS THE "BUT-FOR" SCENARIO AND IS BIASED TO OVERSTATE DAMAGES

23. In his Class Motion, Plaintiff asserts that Cree's use of the Accused Claims caused the prices of the Accused Products to be higher than they otherwise would have been:³⁶

Plaintiff's theory of liability is that he and the other Class members paid a premium for Cree's LED bulbs based on the material misrepresentations made by Cree on the bulbs' labeling, and reinforced in its marketing, in particular, that the LED bulbs last longer than as compared to incandescent bulbs and thus result in energy and cost savings to the consumer and that representation is affirmed by a performance warranty.

Plaintiff states that the Accused Claims "allow Cree to command a premium price" for the Accused Products that Mr. Boedeker's proposed approach will measure that premium.³⁷

24. However, according to Mr. Boedeker himself, that is neither the purpose nor the result of his method. His approach does not, and indeed cannot, identify whether prices for the Accused Products would have been lower in the "but-for" world, nor can it measure the amount of any such reduction. Mr. Boedeker's proposed approach therefore fails to determine whether all (or any) members of the putative class suffered an "economic loss" and further does not measure such loss for anyone.

25. This problem is evident from Mr. Boedeker's own description of his approach. Rather than describing his method as measuring the true "but-for" price—i.e., the price that would have prevailed in a world in which Cree removed the Accused Claims from the package—Mr. Boedeker states that he intends to identify "the price point on the demand curve that ensures that the same number of units that were sold in the actual world would also be sold in the but-for world."³⁸ As shown in Figure 3, a stylized representation of the marketplace reproduced

³⁶ Class Motion, p. 19.

³⁷ Class Motion, pp. 1 and 19-21.

³⁸ Boedeker Report, p. 18.

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from Mr. Boedeker’s report, the “but-for price” and the price Mr. Boedeker seeks to identify are not the same. Figure 3 shows three key price points from Mr. Boedeker’s example:

- 1) Actual market price of \$2.99 (large red dot)—This price is determined by the intersection of consumers’ willingness to pay for the Accused Products as actually sold (the grey line, also called the “demand curve”) and the retailers’ willingness to sell the Accused Products (orange line, also called the “supply curve”).
- 2) “But-for” market price of \$2.38 (large green dot)—This price is determined by the intersection of consumer demand for the Accused Products without the Accused Claims (blue line) and the supply curve.³⁹ As described by Mr. Boedeker, this price represents the “market equilibrium” in the scenario where the Accused Claims are removed from the package.⁴⁰
- 3) Mr. Boedeker’s proposed price of \$1.17 (large blue dot)—This is the price Mr. Boedeker proposes to estimate, which is the price “that ensures that the same number of units that were sold in the actual world would also be sold in the but-for world.”⁴¹

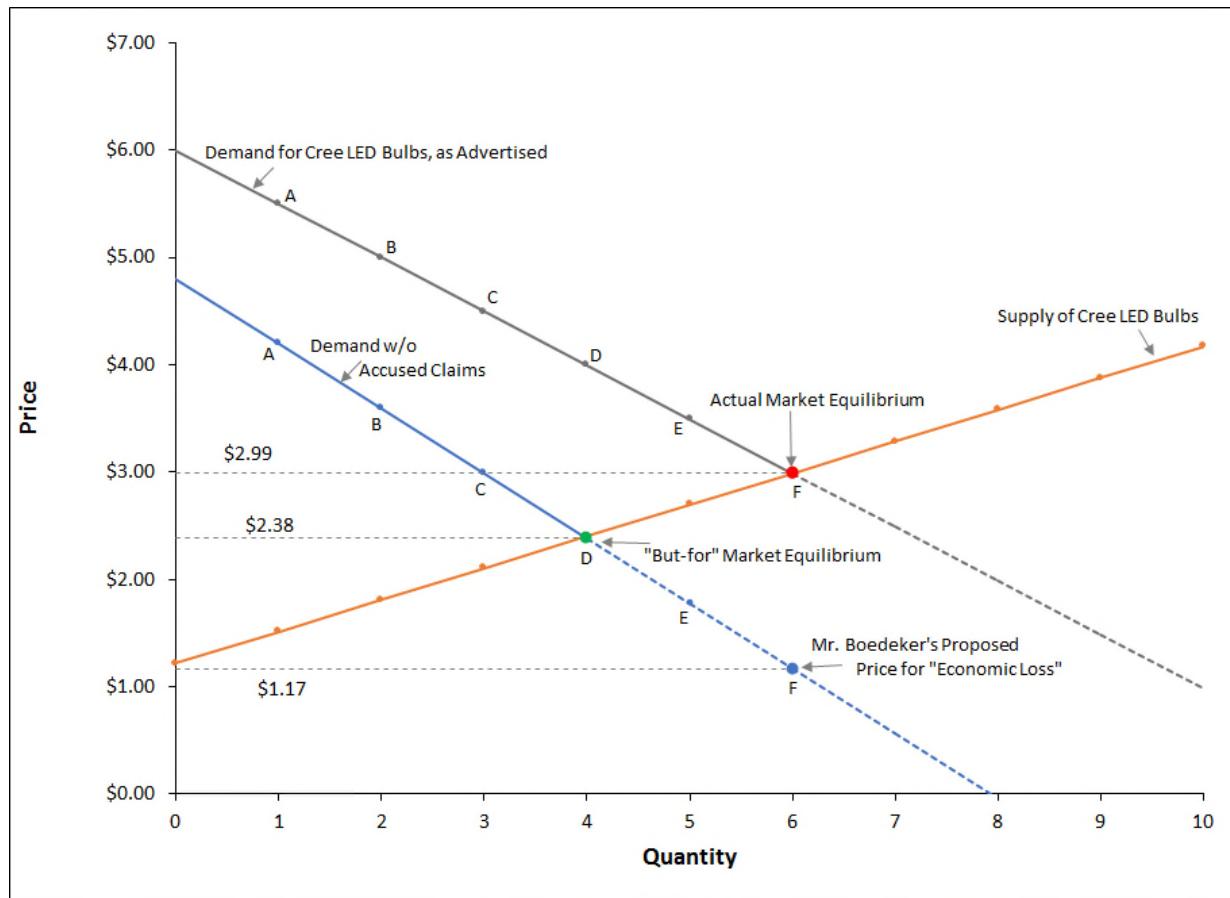
³⁹ Two assumptions implicit in Mr. Boedeker’s hypothetical scenario are 1) removing the Accused Claims would cause consumer demand to fall—i.e., that consumers in the aggregate would be willing to buy fewer bulbs at any given price point; and 2) the retailers are willing to sell more units at higher prices—i.e., that the supply curve slopes upward. I address both issues in more detail, below.

⁴⁰ Boedeker Report, p. 17.

⁴¹ Boedeker Report, p. 18.

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Figure 3
Mr. Boedeker's Stylized Market Example



Source: Boedeker Report, Figure 10 with annotations.

26. In Mr. Boedeker's stylized scenario, the putative class is comprised of six consumers (labeled "A" through "F") each of whom purchased the product with the Accused Claims at a price of \$2.99 per unit. In the "but-for" world where Cree removes the Accused Claims, demand for the product presumably falls and the retailer lowers the price to \$2.38 per unit. At that lower price, only four of the six consumers (A,B,C,D) now purchase the product. For those four consumers, damages are the difference between the actual price paid (\$2.99) and the market price without the Accused Claims (\$2.38)—i.e., \$0.61.⁴² That is the "price premium" as defined by Plaintiff in his Class Motion.

⁴² Boedeker Report, p. 17.

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27. Damages for the other two consumers (E, F) are not clear under this framework, since they choose not to purchase the product in the “but-for” world. Those consumers’ damages would depend on their actions in the “but-for” world, which in turn would depend on their preferences and the alternatives available to them. For example, suppose in the “but-for” world Consumer E would choose instead to buy a competing LED lightbulb. That consumer’s damages would depend on the different features and prices of the Accused Product relative to the alternative product, but certainly could be no more than the difference between the market price and that consumer’s willingness to pay for the product without the Accused Claims (\$1.21 in this example).⁴³ Similarly, damages for Consumer F are not identifiable from this framework, but could be no greater than \$1.82.⁴⁴

28. This framework demonstrates two major problems with using a consumer survey to estimate damages in this type of case. First, a consumer survey only provides estimates of consumers’ willingness to pay for a product with a particular claim on the label relative to their willingness to pay for a similar product without that claim. In other words, a consumer survey only can provide information about how the “demand side” of the market might react to the removal of a particular label claim. A consumer survey cannot provide evidence of how the seller or its competitors would react in such an environment (“supply-side” factors). Since market prices are determined by the interaction of supply and demand, the “but-for” price (and therefore the “price premium”) cannot be determined from a consumer survey alone.

29. The literature by conjoint practitioners is clear on this point. For example, as noted in a paper presented jointly by several practitioners and academics at the Sawtooth Software Conference, a gathering organized by the company that produces the software used by Mr. Boedeker: “In the context of conjoint studies, feature valuation is achieved by using various

⁴³ \$1.21 is the difference between the actual market price (\$2.99) and the price at which Consumer E would be willing to purchase the product without the Accused Claims (\$1.78).

⁴⁴ \$1.82 is the difference between the actual market price (\$2.99) and the price at which Consumer F would be willing to purchase the product without the Accused Claims (\$1.17).

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measures that relate only to the demand for the products and features and not to the supply.”⁴⁵ The authors state that estimates of consumer willingness to pay derived from conjoint surveys “do not take into account equilibrium adjustments in the market as one of the products is enhanced by addition of a feature” and further that “[c]omputation of changes in the market equilibrium due to feature enhancement of one product will be required to develop a measure of the economic value of the feature.”⁴⁶ The authors conclude that estimates based on consumer willingness to pay “will overstate the price premium afforded by feature enhancement.”⁴⁷

30. The importance of addressing the supply side of the market can be seen by comparing the “price premium” evident in Figure 3, above, with the premium derived from a slightly different version of Mr. Boedeker’s stylized example, shown below in Figure 4. In this example, the supply curve is flat—i.e., the retailer chooses to charge the same amount for the product regardless of how many units are demanded by consumers. This situation could occur in a variety of retail scenarios. For example, if the seller utilizes the strategy of “line pricing,” then changing some of the features or the label of the product could have no impact on the retail price.⁴⁸ Another strategy that could result in no price change is the use of “price points,” whereby the seller chooses to maintain the price of a particular product at a specific figure, such as a price ending in “\$0.99,” even in the face of marketplace adjustments such as changes in costs or consumer demand.⁴⁹ More generally, a seller of a differentiated consumer product, such as a branded LED lightbulb, chooses its own pricing strategy.⁵⁰ Determining its

⁴⁵ Greg Allenby, Jeff Brazell, John Howell, and Peter Rossi, “Using Conjoint Analysis to Determine the Market Value of Product Features,” in Proceedings of the Sawtooth Software Conference, October 2013, p. 343. See also, Greg Allenby, Jeff D. Brazell, John R. Howell, and Peter E. Rossi, “Valuation of Patented Product Features,” *The Journal of Law & Economics*, v. 57, n. 3, August 2014, pp. 629-663; and Greg Allenby, Jeff D. Brazell, John R. Howell, and Peter E. Rossi, “Economic Valuation of Product Features,” *Quantitative Marketing and Economics*, v. 12, n. 4, December 2014, pp. 421-456.

⁴⁶ Allenby, et. al (2013), pp. 346-347.

⁴⁷ Allenby, et. al (2013), p. 347.

⁴⁸ Line pricing is a common practice used by retailers, which involves offering different product “lines” at different prices while maintaining a single price for products within each “line.” [See, for example, Michaela Draganska and Dipak Jain, “Consumer Preferences and Product-Line Pricing Strategies: An Empirical Analysis,” *Marketing Science*, v. 25, n. 2, March 2006, pp. 164-174]

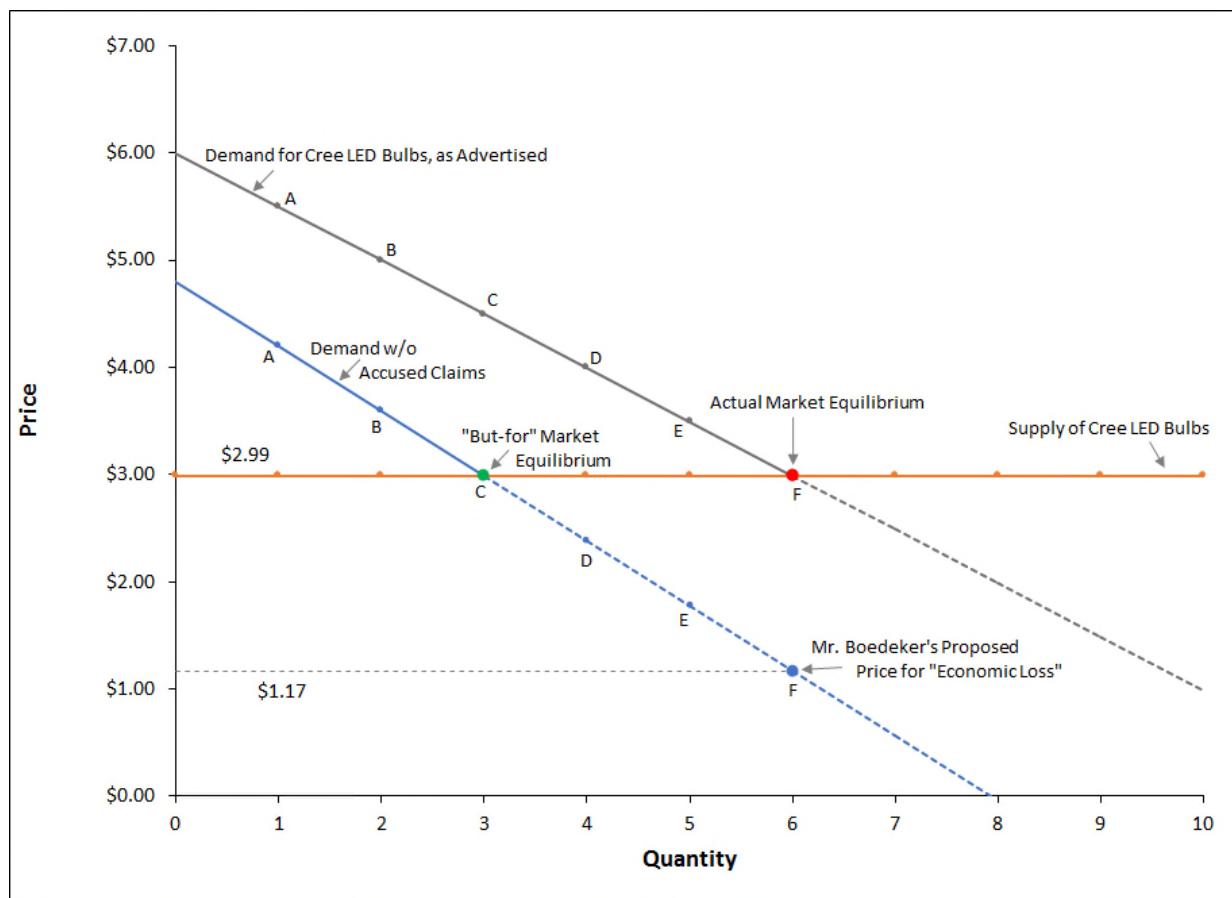
⁴⁹ See, for example, Daniel Levy, Dongwon Lee, Haipeng (Allan) Chen, Robert J. Kauffman, and Mark Bergen, “Price Points and Price Rigidity,” *The Review of Economics and Statistics*, v. 93, n. 4, November 2011, pp. 1417-1431.

⁵⁰ See, for example, Jean Tirole, The Theory of Industrial Organization, Cambridge, MA: The MIT Press, 1988, pp. 277-295.

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willingness to sell a product with and without particular label claims requires an assessment of that strategy and a prediction of the resulting marketplace outcome. As shown in Figure 4, given the sellers' strategy of maintaining price at a constant level, in the "but-for" world with the Accused Claims removed from the label, three consumers (A,B,C) would purchase the product at the market price. Since these consumers receive the same product and pay the same price in both the actual and "but-for" worlds, they suffered no damages and the "price premium" is zero. The examples in Figure 3 and Figure 4 show that the "price premium" depends on the seller's behavior, as well as the buyers', and therefore cannot be determined solely from a consumer survey.

Figure 4
Mr. Boedeker's Stylized Market Example, with a Horizontal Supply Curve



Source: Boedeker Report, Figure 10 with annotations and horizontal supply curve.

31. The examples above illustrate a second critical problem with attempting to measure damages through just a consumer survey. As shown in both scenarios, in the "but-for" world

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some consumers would choose not to buy the Accused Product. Mr. Boedeker’s framework, however, provides no method either to identify those consumers among the universe of all consumers nor does it provide a method to assess their actual damages. For example, using the scenario in Figure 3, suppose in the “but-for” world Consumer E would choose instead to buy a competing LED lightbulb. That consumer’s damages would depend on the different features and prices of the Accused Product relative to the alternative product, but certainly could be no more than the difference between the market price and that consumer’s willingness to pay for the product without the Accused Claims (\$1.21 in this example). Similarly, suppose Consumer F would choose not to buy any LED lightbulb. It is unclear how one might assess that consumer’s damages, but again those damages could be no more than the difference between the market price and the consumer’s willingness to pay for the product without the Accused Claims (\$1.82 in this example). Thus, under a “price premium” theory, damages for some consumers could be as low as zero. For other consumers, damages could be no higher than the difference between the actual market price and their willingness to pay for the product without the Accused Claims, which would differ for each consumer. Moreover, since consumer behavior in the “but-for” world is not actually observed, there would be no way to determine the amount of damages to award to each consumer, absent individualized inquiries into their preferences, budget, available options, etc.

32. As an ostensible solution to these problems, Mr. Boedeker discards the “price premium” concept from his assessment of damages.⁵¹ Instead, he proposes to award each member of the putative class an amount equal to the difference between the actual price and the lowest willingness to pay for the product without the Accused Claims among members of the putative class—i.e., the willingness to pay for Consumer F in the above examples, or \$1.82. This amount bears no relation to any marketplace outcome under conditions derived from real-world data. As justification for this approach, Mr. Boedeker asserts, “To fully compensate all consumers for their economic loss, it is necessary to find the price point on the demand curve that ensures that the same number of units that were sold in the actual world would also be sold

⁵¹ Despite Plaintiff’s assertion that he will measure damages based on “the difference between the prices customers paid and the value of the [Bulbs] they bought,” which Plaintiff terms a “price premium,” the only reference to that term in Mr. Boedeker’s report is a single quote from Plaintiff’s Complaint. [Class Motion, p. 20]

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in the but-for-world.”⁵² Here, Mr. Boedeker has invented a new concept of the “but-for” world. Instead of representing the marketplace outcome that would occur if the seller removed the Accused Claims from the product, Mr. Boedeker has redefined the “but-for” world to be a scenario in which the seller is forced to lower the price of the product in order to assure the same amount of sales as in the actual world. Mr. Boedeker does not identify any real-world conditions that would cause such an outcome. Rather, his approach appears to be based simply on convenience. Referring to his stylized example, shown in Figure 3 above, Mr. Boedeker acknowledges that four of the six consumers could be made whole with a damages award equal to the “price premium” of \$0.61.⁵³ He then asserts that, because that amount “does not compensate *all* purchasers,” he therefore must identify a larger number that is sufficient to do so.⁵⁴

33. The obvious problem with Mr. Boedeker’s approach is that it necessarily results in awards that exceed actual damages for many, if not all, consumers. If, as shown in Mr. Boedeker’s example (Figure 3, above), some consumers paid a “price premium” of \$0.61 (Consumers A-D), then an award of \$1.82 does not “compensate” those consumers for their damages—it “overcompenses” them. The \$1.82 figure also overcompensates Consumer E, whose maximum potential damages equal \$1.21 as discussed above. Finally, even for Consumer F \$1.82 represents the *maximum* potential damages. Actual damages could be less, depending on Consumer F’s behavior in the “but-for” world. Thus, Mr. Boedeker proposes a method that is guaranteed to overcompensate some members of the putative class, and potentially may overcompensate all of them.

VI. MR. BOEDEKER’S SURVEY DOES NOT ADDRESS PLAINTIFF’S CLAIMS

34. Plaintiff asserts that Cree’s products are labeled with false and/or misleading claims related to the “longevity” of the lightbulbs and the energy savings that relate to longevity. For example, the Complaint alleges:⁵⁵

⁵² Boedeker Report, p. 18.

⁵³ Boedeker Report, p. 18.

⁵⁴ Boedeker Report, p. 18 (emphasis added).

⁵⁵ Complaint, ¶4.

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Cree's packaging offers a "100% Satisfaction Guarantee" for LED Bulbs and an estimated lifetime of between 15-32 years depending on the product. The packages further offer an estimated yearly energy cost savings ranging from around \$0.60 to \$2 per bulb per year. Cree packaging also offers a "10 Year Warranty."

Similarly, the Class Motion alleges:⁵⁶

[A]ll Cree LED Lightbulbs...are marketed and labeled to highlight the following characteristics focused on longevity of the Bulbs: (1) a promise that they will last longer than the comparative incandescent bulb, which therefore results in energy and cost savings; and (2) a warranty for performance, which reinforces the longevity representations.

Notwithstanding the variety of allegations, Plaintiff proposes to evaluate a single issue with respect to liability—namely, whether Cree's label claims "promise longevity far longer than the Bulbs actually last."⁵⁷

35. However, the statements tested by Mr. Boedeker in his conjoint survey correspond neither to the components of Plaintiff's claims remaining after the Court's exclusions nor to the single issue Plaintiff proposes to evaluate with respect to liability. As a result, even setting aside the fundamental problems with his proposed framework for assessing damages, described above, Mr. Boedeker's opinions cannot serve as a basis for determining whether members of the putative class suffered damages at all, let alone provide a measurement of the amount of class-wide damages. Furthermore, as described in Section III.A, above, some of the claims accused by Plaintiff were not present on all the Accused Products. Mr. Boedeker, however, provides only a single survey with a single set of results, which he puts forward as a method to assess class-wide damages. He provides no method to determine which members of the putative class purchased products which contained the different versions of the Accused Claims.

36. Mr. Boedeker evaluates three attributes in his survey that relate to the performance of the Accused Products. The first is the presence or absence of the statement "[t]he LED light bulb will last six times longer than cheap LED bulbs."⁵⁸ I understand, however, that statement

⁵⁶ Class Motion, p. 3.

⁵⁷ Class Motion, p. 5.

⁵⁸ Boedeker Report, pp. 58-59 and supporting document "LED Conjoint Survey.docx".

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never was present on the package of the Accused Products.⁵⁹ Moreover, Mr. Boedeker performs no analysis to determine the extent to which members of the putative class had any exposure to that claim, and therefore cannot evaluate whether that claim could have influenced their willingness to pay for the Accused Products. Thus, there is no basis to allege, as Mr. Boedeker does, that his estimated “attribute value” or “economic loss” associated with that feature has any relation to consumers’ damages, even under his stated framework.

37. Second, Mr. Boedeker includes a product attribute described as “Lasts XX+ years (XX hours) with estimated lifetime savings of \$XX over incandescent bulbs” (with four different sets of values for the “XX”).⁶⁰ In his Class Motion, Plaintiff cites Mr. Boedeker’s survey results for this feature as providing measurements of “the economic loss attributable to the purchase of the falsely labeled Bulbs.”⁶¹ However, as described in the Court’s April 2018 Order, the first half of the claim providing an explicit longevity estimate—“Lasts XX+ years (XX hours)” —cannot be subject to liability, since it simply reiterates or presents in a substantially similar manner the disclosures required under the EPCA that are present in the Lighting Facts box.⁶² Since Mr. Boedeker does not test the latter half of the claim alone, his estimated “attribute value” or “economic loss” associated with that feature cannot be used as a basis for assessing damages.

38. Finally, Mr. Boedeker tests a feature related to a warranty. Specifically, he tests the claim of a “10-year 100% satisfaction guarantee” versus two alternatives (“standard 90-day warranty” and “10 years with original receipt and packaging, have to pay for shipment”).⁶³ In his Class Motion, Plaintiff asserts that the “satisfaction guarantee” claim “reinforces the

⁵⁹ In deposition, Mr. Boedeker testified that his awareness of that claim was based on the Court’s April 2018 Order, which notes that claim is shown on Cree’s website. [Deposition of Stefan Boedeker, March 12, 2019 (“Boedeker Deposition”), pp. 75-78, citing April 2018 Order, p. 10] None of the 50+ labels that I reviewed contained this statement.

⁶⁰ Boedeker Report, pp. 58-59 and supporting document “LED Conjoint Survey.docx”.

⁶¹ Class Motion, p. 20.

⁶² See, Section III.B.

⁶³ Boedeker Report, pp. 58-59 and supporting document “LED Conjoint Survey.docx”.

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longevity promises.”⁶⁴ However, there are multiple problems with the use of this attribute to assess class-wide damages.

39. First, it is clear from an examination of various product packages that claims related to a warranty or “satisfaction guarantee” differed substantially across the Accused Products. One package identified by Plaintiff contains the claim of “100% Satisfaction Guaranteed.”⁶⁵ Many other labels do not contain that claim, but contain other claims related to the warranty, including:

- “5 YEAR WARRANTY” and “LIMITED WARRANTY: This product has a 5 year, free replacement warranty. If this product does not operate for 5 years...return the product with UPC code proof of purchase, register receipt and your name and address to Cree...Cree will send you a replacement or at Cree’s option refund the original purchase price”;⁶⁶
- “5 YEAR WARRANTY” and “LIMITED WARRANTY: If this bulb does not operate for 10 years (based on 6 hours per day / 7 days per week of normal consumer use)... return the bulb with proof of purchase, register receipt and your name and address to Cree...Cree will send you a replacement or at Cree’s option refund the original purchase price”;⁶⁷ and
- “10 YEAR WARRANTY” and “LIMITED WARRANTY: If this bulb does not operate for 10 years (based on 6 hours per day / 7 days per week of normal consumer use)...return the bulb with proof of purchase, register receipt and your name and address to Cree...Cree will send you a replacement or at Cree’s option refund the original purchase price.”⁶⁸

⁶⁴ Class Motion, p. 4. In deposition, Mr. Boedeker also asserted that the “satisfaction guarantee” claim was an “indication of longevity.” [Boedeker Deposition, pp. 70-71]

⁶⁵ Complaint, ¶18; and Boedeker Report, p. 4. These package versions have additional claims in fine print which are not readable as presented.

⁶⁶ CREE_00062461 and CREE_00065370.

⁶⁷ CREE_00065190 and CREE_00065201.

⁶⁸ CREE_00060645 and CREE_00065185.

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As above, however, Mr. Boedeker does not test these specific representations and further provides no methodology for assessing which members of the putative class purchased products with which representations, or even the overall frequency of each representation across all the Accused Products. Mr. Boedeker’s method therefore cannot determine the extent to which those representations may have affected class-wide willingness to pay.

40. Second, despite the assertions by Plaintiff and Mr. Boedeker, it is unclear to what extent the label statements about a warranty or a “satisfaction guarantee” have any relation to the perceived longevity of the Accused Products. Plaintiff asserts that he will be able to demonstrate that the Accused Products did not offer the longevity that was “promised” by Cree.⁶⁹ Plaintiff, however, does not offer a class-wide method (or even assert that he will do so) to assess whether Cree failed to comply with the stated warranties on the products or whether consumers did not have “satisfaction guaranteed.” Thus, Mr. Boedeker’s analysis of the “economic loss” associated with the “satisfaction guaranteed” claim does not correspond with any theory of liability put forward by Plaintiff.

41. In sum, the only common representations about “longevity” evaluated by Mr. Boedeker are ones that have been excluded from this case by the Court. The other claims that he evaluates are unrelated to Plaintiff’s assertions about a common proof of liability and/or were not present on any (or at least some) of the Accused Products. Mr. Boedeker’s proposed approach therefore fails to provide a class-wide method for assessing damages related to Plaintiff’s specific allegations.

VII. MR. BOEDEKER’S USE OF HIS SURVEY RESULTS DOES NOT COMPORT WITH HIS OWN FRAMEWORK FOR DAMAGES

42. In addition to the basic problems with his proposed framework and the lack of correspondence between his survey and Plaintiff’s theory of liability, Mr. Boedeker’s approach suffers from a further, critical flaw. The “market simulations” that he performs using his survey results do not provide the data that he claims he needs to fulfill his theoretical framework for damages. Consequently, Mr. Boedeker’s methodology does not provide a valid

⁶⁹ Class Motion, pp. 5-6.

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basis for assessing class-wide damages, even setting aside the other problems with his approach, described above.

43. In the section of his report in which he lays out his proposed damages framework, Mr. Boedeker states that for his damages approach “it is necessary to find the price point on the demand curve that ensures that the same number of units that were sold in the actual world would also be sold in the but-for-world.”⁷⁰ He then proposes to compare that price to the actual price paid by members of the putative class. Mr. Boedeker states that “[t]he difference between these two prices is the economic loss to every member of the putative class.”⁷¹ Figure 5 shows an example of Mr. Boedeker’s calculations, as presented in his report, which he uses to purportedly fulfil the requirements of his proposed framework. This example shows the estimated share of survey respondents who would buy one of the hypothetical products presented in the survey with and without the “Longevity Claims” at each of the five price points tested.⁷² The vertical arrows represent the “economic loss” calculated for each of the resulting ten combinations of price points and “Longevity Claims.” For the example in Figure 5, the values for Mr. Boedeker’s “economic loss” range from \$1.40 to \$4.47. Mr. Boedeker performed similar calculations for products comprised of every possible set of hypothetical attributes included in his survey. He then calculated the range of “economic losses” from all those combinations, excluding the outlying 10-percent values, and the median value. For the hypothetical 60W product, Mr. Boedeker calculated the “economic loss” to range from \$1.34 to \$4.01, with a median value of \$2.40.⁷³

⁷⁰ Boedeker Report, p. 20.

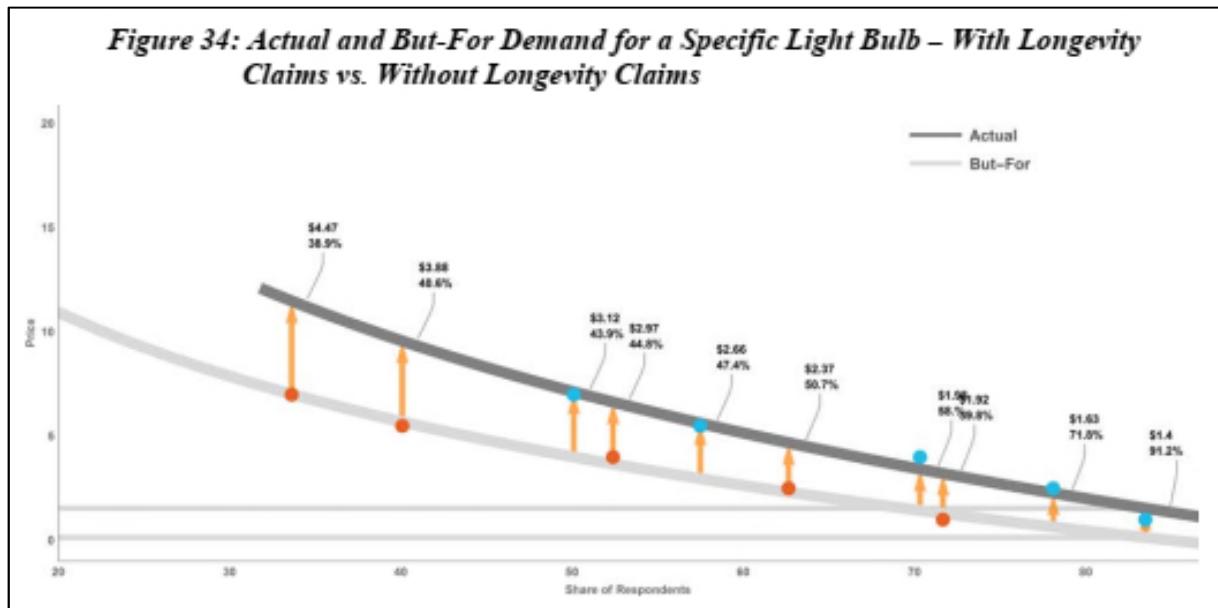
⁷¹ Boedeker Report, p. 20.

⁷² In this example, “with the Longevity Claims” represents a hypothetical 60W product with the label claim “lasts 31+ years (35,000 hours) with estimated lifetime savings of \$192.50 over incandescent bulbs.” “Without the Longevity Claims” represents the same hypothetical 60W product with the label claim “lasts 4+ years (5,000 hours), with estimated lifetime savings of \$27.50 over incandescent bulbs.” [Boedeker Report, pp. 71-73 and supporting materials]

⁷³ Boedeker Report, p. 72.

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Figure 5
Mr. Boedeker’s “Demand Curves,” Based on Survey Results for One Product Specification



Source: Boedeker Report, Figure 34.

44. There are two general categories of problems with this approach. First, Mr. Boedeker’s approach does not calculate actual marketplace demand curves for the Accused Products. A demand curve represents the number of units of a product consumers are collectively willing to purchase at each price point. As described above, when presenting his theoretical “model for economic loss,” Mr. Boedeker states that he will calculate damages by “moving down the demand curve in the but-for-world to the point of volume sold in the actual world.”⁷⁴ Mr. Boedeker’s actual calculations, however, bear no relation to the “volume sold in the actual world,” nor do they relate to consumer demand for the actual products at issue. Instead, as shown in Figure 5, Mr. Boedeker calculates the *share of survey respondents* who would purchase *hypothetical products* as represented in his survey at different price points. Mr. Boedeker performs no analysis to determine whether the “share of respondents” measured through his approach corresponds to any actual share in the marketplace or whether the survey respondents’ demand for the hypothetical products in the survey corresponds to actual consumers’ demand for the Accused Products.

⁷⁴ Boedeker Report, p. 18.

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45. The literature on conjoint analysis makes clear that the results of conjoint surveys cannot be interpreted as statements about actual market shares and generally cautions against using the results of conjoint surveys to make specific predictions about consumer demand. For example, Bryan Orme, the founder of Sawtooth Software and cited multiple times by Mr. Boedeker, states in his book Getting Started with Conjoint Analysis:⁷⁵

Conjoint models do not predict market share...

Believing that we have an accurate predictor of market share can lead us to misuse a model. That said, conjoint models are excellent directional indicators. Conjoint analysis can reveal product modifications that can increase market share, but it will probably not reveal how much actual market share will increase. Conjoint analysis can tell us that the market is more price sensitive for Brand A than Brand B; but we probably do not know the exact price sensitivity of either one. Conjoint analysis can identify which market segment will be most likely to purchase your client's product, but probably not the exact number of units that will be purchased.

The market simulator is usually the most anticipated deliverable for managers. Do not let this enthusiasm get out of hand. Conjoint simulators are directional indicators that can provide a great deal of information about relative feature importances and preferences for product configurations. While conjoint simulators are excellent tools for revealing strategic moves that can improve the success of a product, they are not infallible market share predictors. Many other factors, such as awareness, distribution, advertising, and product life cycles, drive market share in the real world. Conjoint models can be fine-tuned to account partially for these elements, but we must avoid thinking that adjusted conjoint models can consistently and accurately predict volumetric absolutes such as market share. The only exception to this rule follows from careful validation based on real sales data, establishing a clear link between the calibrated conjoint model and sales volume for the specific product category and market in question.

In contrast to the guidance from Mr. Orme, Mr. Boedeker uses conjoint analysis not for “directional indicators,” but rather to make specific predictions about purchasing behavior and price sensitivity.

46. Mr. Orme further describes various reasons why conjoint surveys may not accurately predict marketplace behavior including “awareness [of actual purchasers] developed through advertising and promotion,” whether “the relevant attributes have been included in the

⁷⁵ Bryan K. Orme, Getting Started with Conjoint Analysis: Strategies for Pricing Research, 3rd ed., Madison: Research Publishers LLC, 2014, pp. 26-27.

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simulation model,” whether “respondents are educated about available brands,” and many other reasons.⁷⁶ Similarly, another book cited by Mr. Boedeker describes the importance of modeling actual products available in the marketplace when attempting to predict consumer demand:⁷⁷

...if our interest is to predict the market demand for a modified product, the set of items will be the modified product and all other items in the market (except, of course, for the old product before modification). If the interest is in predicting the demand for a new item, the set of items will be the items currently on the market plus the new item.

Mr. Boedeker, however, makes no attempt to include specific products available on the market or actual brand information. Instead he tests hypothetical products comprised of only six features presented in text format, omitting brand and the physical product entirely. As noted by Mr. Orme, above, “careful validation based on real sales data” can potentially improve the accuracy of conjoint analysis for predictions of marketplace behavior; yet, Mr. Boedeker performs no such validation. Many other conjoint practitioners as well as academics caution against interpreting results from individual conjoint studies as predictions of marketplace behavior absent any validation against external data.⁷⁸

47. A second problem with Mr. Boedeker’s approach relates to the range of results from his calculations. Even if his survey produced representations of true marketplace demand for the Accused Products (which it does not), he still provides no method for determining the point on

⁷⁶ Orme (2014), pp. 26 and 92.

⁷⁷ Vithala R. Rao, Applied Conjoint Analysis, Berlin: Springer-Verlag, 2014, p. 99.

⁷⁸ See, for example, Min Ding, Rajdeep Grewal, and John Liechty, “Incentive-Aligned Conjoint Analysis,” *Journal of Marketing Research*, v. 42, February 2005, pp. 67-82 at 67 (“Because most conjoint studies are conducted in hypothetical situations with no consumption consequences for the participants, the extent to which the studies are able to uncover ‘true’ consumer preference structures is questionable.”); Andrew Goett, Kathleen Hudson, and Kenneth Train, “Customers’ Choice Among Retail Energy Suppliers: The Willingness-to-Pay for Service Attributes,” *The Energy Journal*, v. 21, n. 4, 2000, pp. 1-28 at p. 27 (“In choice experiments, customers can have a tendency to de-emphasize price, since they do not have to actually pay the price. This deemphasis, to the extent that it exists, creates an upward bias in the estimated willingness to pay for non-price attributes.”); and Chris Chapman, “9 Things Clients Get Wrong About Conjoint Analysis,” in Proceedings of the Sawtooth Software Conference, October 2013 (“...preference share is only partially indicative of real market results... If we iterate studies, know that we’re assessing the right things, calibrate to the market, and include other effects, we will get progressively better estimates of the likely market response. [Conjoint Analysis] is a fundamental part of that, yet only one part. Yes, we can predict market share (sometimes)! But an isolated, single-shot [Conjoint Analysis] is not likely to do so very well.”)

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those demand curves that corresponds to “the volume sold in the actual world,” which is what he claims he will do when he sets forth his “model for economic loss.” Mr. Boedeker acknowledged this point in his deposition, referring to his results by stating that “it’s not units sold in the market because I don’t have that number.”⁷⁹ Yet “units sold in the market” is precisely the measure needed to fulfill the requirement for his theoretical framework for damages. The example from Mr. Boedeker’s results, shown in Figure 5 above, demonstrates the problem. In that example alone (one of hundreds evaluated by Mr. Boedeker), the distance between the two “demand curves” ranges from \$1.40 to \$4.47. Yet Mr. Boedeker provides no method to determine which value in that range might correspond to the class-wide damage amount in this case. Instead of identifying the actual “economic loss,” based on his own theory, he simply calculates *all possible* values for that figure, based on “all possible permutations” of features and price points and the entire range of respondent shares. He then reports a “median economic loss” and a range of values after eliminating 10 percent of the outlier values. He asserts that “in the merits phase of this case” the median value “can be applied to the number of light bulbs that were sold with the false Longevity Claims to assess class-wide economic losses.”⁸⁰ Mr. Boedeker, however, provides no analysis to determine whether the “median economic loss” calculated from his survey relates in any way to the specific figure represented by the distance between two demand curves from the real-world marketplace, as shown in Figure 2, above. Given the wide range of values derived from his survey, the “median economic loss” as calculated by Mr. Boedeker could be substantially different from the “economic loss” specified in his theoretical model.

48. In summary, Mr. Boedeker’s survey and the calculations he performs on the results of that survey do not provide the data required by his theoretical model. Thus, even if that model were appropriate (which it is not) and his survey adequately modeled real-world behavior (which it does not), Mr. Boedeker’s methodology still does not provide a valid basis for assessing class-wide damages.

⁷⁹ Boedeker Deposition, p. 197.

⁸⁰ Boedeker Report, p. 77.

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VIII. PLAINTIFF PROVIDES NO EVIDENCE OF ANY “PRICE PREMIUM” FOR THE ACCUSED CLAIMS AND CREE’S BUSINESS STRATEGY INDICATES THERE WAS NONE

49. Plaintiff claims that he will demonstrate that all members of the putative class suffered damages in the form of a “price premium,” which he describes as “the difference between the prices customers paid and the value of the [Bulbs] they bought.”⁸¹ As I describe above, Mr. Boedeker explicitly disclaims that his proposed approach would measure this amount. Since he performs no analysis of the “supply side” of the marketplace, the results from his survey alone cannot be used to predict prices in the “but-for” scenario. Thus, Plaintiff has neither provided an estimate of any purported “price premium” in the market due to the Accused Claims, nor has he even identified any method to determine whether such a premium existed. Nonetheless, given Plaintiff’s stated theory of damages as expressed in his Complaint and Class Motion, I have been asked to assess whether the evidence supports a conclusion that members of the putative class did pay a “price premium.” To the contrary, I find that the evidence supports a conclusion of *no* price premium due to the Accused Claims.

50. To understand Cree’s approach to marketing and pricing its products, I conducted an interview with Scott Schwab, currently Cree’s Vice President and General Manager, Lamps. Mr. Schwab described the process by which Cree has packaged and priced its LED lightbulb products. First, he described the factors that Cree considers when setting the prices of its products.⁸² Those factors include competitors’ pricing,⁸³ Cree’s costs to manufacture the products,⁸⁴ and negotiations with customers, primarily The Home Depot.⁸⁵ In addition, Cree sets its wholesale prices in a manner such that The Home Depot can charge specific “price points,” for example prices ending in “\$0.97,” and still generate the required margins.⁸⁶ Mr. Schwab further described how the Cree personnel who design the product labels and packaging

⁸¹ Class Motion, p. 20.

⁸² See also, Schwab Deposition, pp. 28-30.

⁸³ See also, CREE_00072985, CREE_00073022, and CREE_00073010.

⁸⁴ See also, CREE_00072996 and CREE_00072997.

⁸⁵ See also, CREE_00073019 and CREE_00073020.

⁸⁶ See also, CREE_00073019, CREE_00073020, CREE_00072997, CREE_00076072, and CREE_00076073.

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are different from those who are responsible for negotiations with Cree’s customers and determining pricing.

51. Based on this information, there is no reason to expect that changes to the specific wording on the packages of Cree’s LED lightbulb products would lead to any change in the prices that Cree or the retailers set for the Accused Products. As described above, Cree has used a variety of claims on the labels of its products, which differ across products and have changed over time. I have seen no evidence that Cree ever adjusted its pricing to account for differences in labels between products or changes in labels over time.

52. Internal strategy documents from Cree support this conclusion. For example, an analysis by Cree in late-2013, which included a roadmap for the company’s future strategy, highlighted the fact that customers’ primary issue in choosing an LED lightbulb was the desire for a product that “Looks and Works like a Light Bulb” and that, given that characteristic, “price is key” “regardless of payback economics.”⁸⁷ These characteristics of consumer demand support Cree’s strategy, which has not focused on differentiation from the competition related to specific performance claims, but rather has focused on continuing to drop prices to match competitors while reducing costs.⁸⁸ In fact, in their presentations of Cree’s strategies, these documents do not reference any specific label claims on Cree’s packages.

53. Based on this information, I conclude that there is no evidence Cree would have adjusted its prices in the “but-for” world where it could not include the Accused Claims on the labels of the Accused Products; and there is considerable evidence Cree would not have done so. As such, there is no support in the record for any “price premium” associated with the Accused Claims.



Jesse David, Ph.D.
March 22, 2019

⁸⁷ CREE_00061728, at pp. 9, 10, and 12. See also, CREE_00061752–758 at 757 and CREE_00055006–030 at 014 and 018.

⁸⁸ CREE _00061728, at pp. 13-14. See also, CREE_00073022.

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APPENDIX 1: MATERIALS CONSIDERED

Case Documents

Order Re: Motion to Dismiss, April 9, 2018

Amended Class Action Complaint, April 30, 2018

Expert Report of Stefan Boedeker in Support of Plaintiff's Motion for Class Certification, January 18, 2019, with supporting materials

Order Granting in Part and Denying in Part Defendant's Motion to Strike Deposition Errata, January 18, 2019

Plaintiff's Memorandum of Law in Support of Motion for Class Certification, May 28, 2019

Deposition Transcripts

Deposition of Jeffry L. Young, September 18, 2018, with Exhibits 1-5 and errata

Deposition of Jonathan Vollers, October 8, 2018, with Exhibits 1-10 and errata

Deposition of Scott Schwab, January 4, 2019, with Exhibits 1-19 and errata

Deposition of Stefan Boedeker, March 12, 2019, with errata

Bates Numbered Documents

CREE_00005413	CREE_00062367 – 368
CREE_00006287	CREE_00062405 – 406
CREE_00049110 – 149	CREE_00062414
CREE_00054132 – 136	CREE_00062459
CREE_00054138 – 139	CREE_00062461
CREE_00054538 – 563	CREE_00063185 – 224
CREE_00055005 – 055	CREE_00064021
CREE_00055520 – 521	CREE_00064032
CREE_00058447 – 448	CREE_00064034
CREE_00060645 – 647	CREE_00064037
CREE_00060650	CREE_00064058
CREE_00060653	CREE_00064719 – 721
CREE_00060656	CREE_00064760 – 762
CREE_00060659	CREE_00064765 – 766
CREE_00060796	CREE_00065183
CREE_00061437	CREE_00065188
CREE_00061442	CREE_00065190
CREE_00061728	CREE_00065193
CREE_00061751 – 758	CREE_00065195

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CREE_00065199	CREE_00070633
CREE_00065201	CREE_00072983
CREE_00065204	CREE_00072985
CREE_00065206	CREE_00072990
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Michaela Draganska and Dipak Jain, “Consumer Preferences and Product-Line Pricing Strategies: An Empirical Analysis,” *Marketing Science*, v. 25, n. 2, March 2006, pp. 164-174

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www.energy.gov/energysaver/save-electricity-and-fuel/lighting-choices-save-you-money/how-energy-efficient-light

U.S. Federal Trade Commission:

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APPENDIX 2: CURRICULUM VITAE OF JESSE DAVID, PH.D.



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Jesse David, Ph.D.

Jesse David is President of Edgeworth Economics and head of Edgeworth's Los Angeles office. Dr. David is an expert on the valuation of intangible assets, market definition, and the assessment of economic impacts in complex commercial disputes and regulatory proceedings. His experience spans intellectual property, antitrust, labor, regulatory, and class certification matters, among other economic issues related to the intersection of business and government.

Dr. David has provided economic consulting and expert testimony for many industries, including pharmaceuticals, telecommunications, agricultural products, finance, petroleum products, chemicals, software, and consumer products. He frequently submits expert reports to and testifies before decision-making bodies, including U.S. federal and state courts, the Federal Energy Regulatory Commission, the National Energy Board of Canada, and various arbitration venues.

Dr. David's consulting practice also includes developing cost-benefit analyses of government regulations and assessing the economic impacts of government policies and other changes in industry structure. Dr. David has prepared studies for entities such as the American Trucking Association, the National Football League Players Association, the San Diego County Water Authority, the New York Power Authority, and the Ocean Conservancy.

EDUCATION

Stanford University
Ph.D., Economics, 2000

Brandeis University
B.A., *magna cum laude*, Economics and Physics, 1991

EMPLOYMENT

Edgeworth Economics, LLC, Washington, D.C.
2019 - present, President
2012 - 2018, Partner
2009 - 2012, Senior Vice President

Criterion Economics, LLC, Washington, D.C.
2009, Senior Vice President

National Economic Research Associates, Inc., White Plains, NY
2004 - 2009 Vice President
2000 - 2004 Senior Consultant
1997 - 1999 Senior Analyst

Stanford University, Palo Alto, CA
1993 - 1995 Research Assistant/Teaching Assistant

TESTIMONY AND EXPERT REPORTS

Sylvia Leyva v. NFI Industries Inc., Superior Court of the State of California for the County of San Bernardino, Central District. Deposition, February 15, 2019.

Amphastar Pharmaceuticals, Inc. and International Medication Systems, Ltd. v. Momenta Pharmaceuticals, Inc. and Sandoz, Inc., U.S. District Court for the District of Massachusetts. Expert reports, December 21, 2018; February 15, 2019; and March 15, 2019.

Entrata, Inc. v. Yardi Systems, Inc., U.S. District Court for the District of Utah, Central Division. Expert report, December 7, 2018.

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POET, LLC, et al. v. Nelson Engineering, Inc., et al., U.S. District Court for the District of South Dakota, Southern Division. Expert reports, September 28, 2018 and November 28, 2018; deposition, January 8, 2019.

Evert Fresh, Inc. v. Housewares America, Inc., U.S. District Court for the District of New Jersey. Expert reports, June 4, 2018 and July 17, 2018.

Rosa Alvarez v. NBTY, Inc. and Nature's Bounty, Inc., U.S. District Court for the Southern District of California. Expert report, June 1, 2018; deposition, September 4, 2018.

Bal Seal Engineering, Inc. v. Nelson Products, Inc., et al., U.S. District Court for the Central District of California. Expert reports, May 7, 2018 and June 5, 2018; deposition, July 27, 2018.

XY, LLC, Beckman Coulter, Inc. and Inguran, LLC d/b/a STgenetics v. Trans Ova Genetics, LC, U.S. District Court for the District of Colorado. Expert report, April 13, 2018; deposition, June 6, 2018.

Sandra Bond v. Berkshire Bank and Berkshire Hills Bancorp, U.S. District Court for the District of Massachusetts. Expert report, November 21, 2017; deposition, January 16, 2018; affidavit, August 13, 2018.

DSM IP Assets, B.V. and DSM Bio-Based Products & Services, B.V. v. Lallemand Specialties, Inc. and Mascoma LLC, U.S. District Court for the Western District of Wisconsin. Expert report, November 21, 2017; deposition, December 14, 2017; trial testimony, May 11 and 14, 2018; declaration, June 20, 2018.

Abbott Laboratories, et al. v. Adelphia Supply USA, et al., U.S. District Court for the Eastern District of New York. Expert reports, November 15, 2017 and January 29, 2018; deposition, February 13, 2018.

Before an Interest Arbitration Board between the Northeast Illinois Regional Commuter Railroad Corporation and the Brotherhood of Railroad Signalmen, National Mediation Board. Expert report, October 20, 2017; arbitration testimony, November 8, 2017.

American Helios Constructors, LLC v. Shoals Technology Group, American Arbitration Association. Expert report, August 29, 2017.

Rembrandt Enterprises, Inc. v. Eurovo S.r.l., U.S. District Court for the Northern District of Iowa. Expert report, July 21, 2017.

United Energy Trading, LLC. v. Pacific Gas and Electric Company, et al., U.S. District Court for the Northern District of California, San Francisco Division. Expert report, May 19, 2017; deposition, September 28, 2017.

Staci Chester, et al. v. TJX Companies, Inc., et al., U.S. District Court for the Central District of California, Eastern Division. Declaration, April 17, 2017.

Stanley Johnson v. Time Warner Cable, et al., U.S. District Court for the District of South Carolina, Columbia Division. Declaration, March 24, 2017.

Momenta Pharmaceuticals, Inc. and Sandoz Inc. v. Amphastar Pharmaceuticals, Inc., et al., U.S. District Court for the District of Massachusetts. Expert report, February 16, 2017; deposition, March 28, 2017; trial testimony, July 18, 2017; declaration, March 20, 2018.

Chad Herron, et al. v. Best Buy Stores, LP, U.S. District Court for the Eastern District of California. Declaration, August 18, 2016; deposition, August 25, 2016.

In Re: AZEK Decking Sales Practices Litigation, U.S. District Court for the District of New Jersey. Declaration, July 25, 2016; deposition, August 17, 2016.

Boston Cab Dispatch, Inc. and EJT Management, Inc. v. Uber Technologies, Inc., U.S. District Court for the District of Massachusetts. Expert report, May 20, 2016.

In Re: Nest Labs Litigation, U.S. District Court for the Northern District of California. Declaration, April 15, 2016; deposition, May 10, 2016.

The Bakery, LLC, et al. v. Kenneth Pritt and Woodford Transportation, LLC, et al., Circuit Court of Greenbrier County, West Virginia. Expert reports, March 21, 2016 and May 27, 2016.

In Re: Scotts EZ Seed Litigation, U.S. District Court for the Southern District of New York. Expert report, March 11, 2016; deposition, April 20, 2016.

Digital Recognition Network, Inc. v. Accurate Adjustments, Inc., et al., U.S. District Court for the Northern District of Texas, Fort Worth Division. Expert reports, January 22, 2016 and February 22, 2016; deposition, February 25, 2016.

American Helios Contractors, LLC v. Bradley Kogan, Precision Renewables, LLC, and 3TAC, LLC, District Court for Clark County Nevada. Expert report, November 13, 2015.

Christopher Lewert v. Boiron, Inc. and Boiron USA, Inc., U.S. District Court for the Central District of California. Expert report, October 1, 2015; deposition, April 14, 2016.

Wreal, LLC v. Amazon.com, Inc., U.S. District Court for the Southern District of Florida, Miami Division. Expert report, September 10, 2015; deposition, September 28, 2015.

Novadaq Technologies Inc. v. Karl Storz Endoscopy-America, Inc. and Karl Storz GmbH & Co. KG, U.S. District Court for the Northern District of California, San Jose Division. Expert report, July 28, 2015; declaration, November 10, 2015.

Globus Medical, Inc. v. DePuy Synthes Products, LLC and DePuy Synthes Sales, Inc., U.S. District Court for the District of Delaware. Expert reports, July 22, 2015 and October 14, 2015; deposition, November 6, 2015.

Broadband iTV, Inc. v. Hawaiian Telcom, Inc., et al., U.S. District Court for the District of Hawaii. Expert reports, June 30, 2015 and July 28, 2015; declaration, July 10, 2015; deposition, July 29, 2015.

Greater Houston Transportation Company, et al. v. Uber Technologies, Inc. and Lyft Inc., U.S. District Court for the Southern District of Texas, Houston Division. Expert reports, June 29, 2015 and November 19, 2015; declaration, August 27, 2015; deposition, January 8, 2016.

Crystal Good, et al. v. American Water Works Company, Inc., et al., U.S. District Court for the Southern District of West Virginia. Expert report, May 22, 2015; deposition, June 12, 2015.

In Re: Processed Egg Products Antitrust Litigation, U.S. District Court for the Eastern District of Pennsylvania. Expert report, March 13, 2015; deposition, May 5, 2015; affidavit, September 8, 2015; hearing testimony, December 16, 2015; trial testimony, May 29, 2018.

Santarus, Inc. and The Curators of the University of Missouri v. Par Pharmaceutical, Inc., U.S. District Court for the District of Delaware. Expert report, April 21, 2014; deposition, June 12, 2014.

Mylan Technologies, Inc. formerly known as Bertek, Inc., and Mylan, Inc. v. Zydus Noveltech, Inc., Sharad K. Govil, Cadila Healthcare Ltd., also known as Zydus Cadila, Pankaj Patel, and Sunil Roy, Vermont Superior Court, Chittenden Civil Division. Expert report, October 2, 2013; deposition, November 19, 2013.

Alcon Pharmaceuticals Ltd. and Alcon Research, Ltd. v. Lupin Ltd. and Lupin Pharmaceuticals, Inc., U.S. District Court for the District of Delaware. Expert report, June 28, 2013; deposition, July 24, 2013.

Warner Chilcott Company, LLC v. Lupin Ltd. and Lupin Pharmaceuticals, Inc., and *Warner Chilcott Company, LLC v. Watson Laboratories, Inc.*, U.S. District Court for the District of New Jersey. Expert report, June 12, 2013; deposition, July 11, 2013; trial testimony, October 8, 2013.

In Re: Mushroom Direct Purchaser Antitrust Litigation, U.S. District Court for the Eastern District of Pennsylvania. Expert report, May 15, 2013; deposition, October 25, 2013; hearing testimony, March 24-25, 2015.

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Dey, L.P. and Dey, Inc. v. Teva Parenteral Medicines, Inc., et al., U.S. District Court for the Northern District of West Virginia. Expert report, January 13, 2012; deposition, February 7, 2012; trial testimony, August 2, 2013.

Dow Corning Corporation and Hemlock Semiconductor Corporation v. Jie (George) Xiao, LXEng LLC, and LXE Solar, Inc., U.S. District Court for the Eastern District of Michigan, Northern Division. Declaration, January 9, 2012; expert report, March 1, 2012.

Riverplace Development, LLC v. Charles Cranford, Esquire and Rogers Towers, P.A., Circuit Court, Fourth Judicial Circuit, in and for Duval County, Florida. Depositions, October 12, 2011 and December 21, 2011.

Pfizer, Inc., et al. v. Teva Pharmaceuticals USA, Inc. and Teva Pharmaceuticals Industries, Ltd., U.S. District Court for the District of Delaware. Expert report, June 3, 2011; deposition, July 22, 2011.

Ramona Trombley, et al. v. National City Bank, U.S. District Court for the District of California. Expert report, May 27, 2011; declaration, August 29, 2011.

Rocky Mountain Farmers Union, et al. v. James N. Goldstene, U.S. District Court for the Eastern District of California. Declarations, October 29, 2010 and March 14, 2011.

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Tyco Healthcare Group LP and Mallinckrodt Inc. v. Pharmaceutical Holdings Corporation, Mutual Pharmaceutical Company, Inc. and United Research Laboratories, Inc., U.S. District Court for the District of New Jersey. Declaration, July 22, 2009; deposition, July 23, 2009; hearing testimony, July 29, 2009.

ESCO Corporation v. Bradken Resources Pty Ltd, International Chamber of Commerce, International Court of Arbitration. Expert reports, June 15, 2009 and December 21, 2009; arbitration testimony, January 29, 2010.

Schering Corporation and MSP Singapore Company LLC v. Glenmark Pharmaceuticals Inc., USA and Glenmark Pharmaceuticals Ltd., U.S. District Court for the District of New Jersey. Expert report, May 8, 2009; deposition, June 18, 2009.

Eli Lilly and Company v. Sicor Pharmaceuticals, Inc. and Teva Pharmaceuticals USA, Inc., U.S. District Court for the Southern District of Indiana. Expert report, February 24, 2009; deposition, March 20, 2009.

Tobacco Technology, Inc. v. Taiga International N.V., Thomas J. Massetti, and Marie-Paul Voûte, U.S. District Court for the District of Maryland. Expert report, August 21, 2008; deposition, November 25, 2008.

Dow Jones & Company, Inc. v. Ablaise Ltd. and General Inventions Institute A, Inc., U.S. District Court for the District of Columbia. Expert report, August 20, 2008.

Aspex Eyewear, Inc. and Contour Optik, Inc. v. Clariti Eyewear, Inc., U.S. District Court for the Southern District of New York. Expert report, June 20, 2008.

Boldstar Technical, LLC and Michael S. Powell v. The Home Depot, Inc. and Industriplex, Inc., U.S. District Court for the Southern District of Florida, Fort Lauderdale Division. Expert reports, April 25, 2008 and May 30, 2008; deposition, August 29, 2008; trial testimony, February 10-11, 2010.

Novartis Pharmaceuticals Corporation, Novartis Corporation, and Novartis International AG v. Mylan Pharmaceuticals, Inc. and Mylan Laboratories, Inc., U.S. District Court for the District of New Jersey. Expert report, March 26, 2008; declaration, October 1, 2008; deposition, October 9, 2008.

Gary W. Ogg and Janice Ogg v. Mediacom LLC, Circuit Court of Clay County, Missouri in Liberty. Expert reports, March 5, 2008 and April 3, 2008; deposition, April 4, 2008; trial testimony, March 13 and 17, 2009.

Source Search Technologies, LLC v. LendingTree, LLC, et al., U.S. District Court for the District of New Jersey. Expert report, May 1, 2007; deposition, June 21, 2007.

Federal Insurance Company v. InterDigital Communications Corporation, et al., JAMS arbitration. Deposition, February 27, 2007; arbitration testimony, May 16, 2007.

Student Lifeline, Inc. v. The Senate of the State of New York, et al., U.S. District Court for the Eastern District of New York. Expert report, January 29, 2007; deposition, July 26, 2007.

Pediatrix Screening, Inc. et al v. Telechem International, Inc., U.S. District Court for the Western District of Pennsylvania. Expert reports, December 15, 2006, February 16, 2007, and July 6, 2007; deposition, March 28, 2007; trial testimony, July 18-19, 2007.

Green Mountain Chrysler-Plymouth-Dodge-Jeep, et al. v. Torti, U.S. District Court for the District of Vermont. Expert reports, October 9, 2006 and January 17, 2007.

The Procter & Gamble Company v. Teva Pharmaceuticals USA, Inc., U.S. District Court for the District of Delaware. Expert report, August 31, 2006; deposition, October 13, 2006; trial testimony, November 6, 2006.

Central Valley Chrysler Jeep, Inc. et al. v. Witherspoon, U.S. District Court for the Eastern District of California. Expert reports, June 12, 2006, October 9, 2006, and January 16, 2007; deposition, October 27, 2006.

Sierra Club et al. v. Robert B. Flowers, et al., U.S. District Court for the Southern District of Florida, Miami Division. Depositions, June 6, 2006 and June 20, 2006; hearing testimony, October 5, 2006; declaration in support of appeal, U.S. Court of Appeals for the Eleventh Circuit, July 27, 2007.

Merck & Co., Inc. v. Teva Pharmaceuticals USA, Inc., U.S. District Court for the District of Delaware. Expert report, April 6, 2006; deposition, August 8, 2006.

Alliance Security Products, Inc. v. Fleming and Company, Pharmaceuticals, U.S. District Court for the Southern District of New York. Expert report, March 30, 2006; deposition, May 17, 2006.

Re Colonial Pipeline Company, Federal Energy Regulatory Commission. Declaration, February 28, 2006.

Tesoro Canada Supply & Distribution Ltd. in Hearing Order MH-2-2005 Regarding an Application for Priority Destination from Chevron Canada Limited, et al., National Energy Board of Canada. Direct testimony, January 18, 2006.

McKesson Information Solutions, LLC v. The TriZetto Group, Inc., U.S. District Court for the District of Delaware. Expert report, November 17, 2005; deposition, November 30, 2005.

Touch-n-Buy, Inc. v. Radiant Telecom, Inc., et al., U.S. District Court for the Southern District of Florida. Expert report, November 9, 2005; deposition, February 8, 2006.

Jamaica Recycling Corp., et al. v. The City of New York, et al., Supreme Court of the State of New York, County of New York. Affidavit, August 18, 2005.

Amerisource Corporation v. RX USA International, Inc., et al., U.S. District Court for the Eastern District of New York. Expert report, August 15, 2005; deposition, June 5, 2006.

Ruth S. King v. McNeil Nutritionals LLC and McNeil PPC-Inc., Supreme Court of the State of New York, County of New York. Declaration, August 3, 2005; deposition, September 26, 2005; also in *Rochelle Suchoff, et al. v. McNeil Nutritionals LLC and McNeil PPC-Inc.*, Superior Court of New Jersey, Law Division, Essex County; *Jason Gregory Turner v. McNeil Nutritionals LLC and McNeil PPC-Inc.*, Superior Court of the State of California for the County of Los Angeles; *Harry Clendenan v. McNeil Nutritionals LLC and McNeil PPC-Inc.*, Circuit Court of Kanawha County, West Virginia; *Elizabeth Leser v. McNeil Nutritionals LLC and McNeil PPC-Inc.*, Court of Common Pleas, Erie County, Ohio; *Bobby Allen Green v. McNeil Nutritionals, LLC*, Judicial Court, Fourth Judicial Circuit in and for Duval County, Florida, Division CV-A; and *Jacqueline Burrows, et al. v. McNeil Nutritionals LLC and McNeil PPC-Inc.*, Superior Court of Massachusetts, Middlesex County.

Braun GmbH v. Rayovac Corporation, U.S. District Court for District of Massachusetts. Expert reports, May 23, 2005 and June 27, 2005; deposition, September 8, 2005.

PediaMed Pharmaceuticals, Inc. v. Breckenridge Pharmaceutical, Inc. and Scientific Laboratories, Inc., U.S. District Court for the District of Maryland, Southern Division. Expert report, October 1, 2004.

Forrest W. Garvin and E-Netec, Corp. v. McGuireWoods, LLP, et al., General Court of Justice, Superior Court Division for the State of North Carolina, Mecklenburg County. Deposition, July 27, 2004.

ResQNet.com, Inc. v. LANSA, Inc., U.S. District Court for the Southern District of New York. Expert reports, July 14, 2004 and January 25, 2007; depositions, August 9, 2004 and May 6, 2011; trial testimony, May 21, 2007 and June 7, 2011.

Allococo Recycling, Ltd. v. John Doherty, U.S. District Court for the Southern District of New York. Expert report, February 4, 2004; deposition, December 9, 2004; declaration, December 2, 2005.

Pinnacle Systems, Inc. v. XOS Technologies, Inc., et al., U.S. District Court for the Northern District of California. Expert report, November 7, 2003; deposition, January 15, 2004; trial testimony, February 11, 2004.

Sinclair Oil Corporation v. BP Pipelines (North America), Inc., Federal Energy Regulatory Commission. Direct testimony, September 18, 2003; rebuttal testimony, March 16, 2004.

SELECTED CONSULTING PROJECTS AND REPORTS

Economic Issues Associated with a Change in the RFS Point of Obligation. Analysis of proposals put forward by various petitioners to change the point of obligation for the RFS regulation from refiners/importers to blenders.

Calculation of potential exposure related to class action claims for false labeling of retail food product. Analysis of retail scanner data and wholesale transaction databases to determine potential price premiums associated with label claims and calculate potential damages related to allegedly false claims.

Calculation of potential exposure related class action claims for unpaid wages. Analysis of card-swipe, payroll, and scheduling data for a public utility to assess potential damages in a class action claim.

Analysis of EPA's Proposal for a Reduction in the RFS Volume Requirements for 2014. Analysis of EPA's proposal to adjust the volumetric requirements under the RFS.

Economic Impacts of the RFS Program: An Analysis of the NERA Report Submitted to the EPA. Analysis of the findings of NERA and CRA regarding economic impacts of waiving the Clean Air Act requirement for ethanol blending in gasoline.

Calculation of potential exposure related class action claims for payroll violations. Analysis of login, payroll, and expense report data for financial services firm to assess potential damages in a class action claim.

The Impact of a Waiver of the RFS Mandate on Food/Feed Prices and the Ethanol Industry. Analysis of the impacts of waiving the Clean Air Act requirement for ethanol blending in gasoline on animal feed prices, household expenditures on food, and the ethanol industry.

Analysis of generic pharmaceutical company's exposure for a potential at-risk launch. Financial analysis of the potential damages against a pharmaceutical company for launching a generic product before patent expiration.

Analysis of coal supply contract escalator. Report on the expected escalation in various cost indices used to determine the pricing of coal in a contract between a mining company and an electric utility.

Review of PHMSA's Regulatory Analysis for the External Piping Requirement. Analysis of cost-benefit for a proposed regulation on external loading pipes for hazardous materials tankers.

The Economic Impact of a Potential NFL Lockout in 2011. Analysis for the National Football Players Association of the impact of a loss of professional football games to the local economies of host cities.

Review of FMCSA's Regulatory Impact Analysis for the 2010-2011 Hours of Service Rule. Cost-benefit study for the American Trucking Associations on the proposed change in regulations of hours of service for long-haul truckers. Testified before Congressional Sub-Committee.

Consulting for an electric power cooperative on class certification in a claim for trespass damages. Analyzed factors involved in hypothetical negotiations between landowners and a transmission line operator related to value of an easement for telecommunications use.

A Cost-Benefit Analysis of Gear Replacement for Gulf Shrimp Fishermen. Analysis prepared for the Ocean Conservancy on the costs and benefits associated with industry-wide changes in equipment used by shrimp fisherman in the Gulf of Mexico.

Analysis of the impacts on competition of a merger in the solid-waste collection industry. Prepared databases for turnover to the U.S. Department of Justice in response to a Second Request. Prepared economic and statistical analyses of transaction data to address questions of competitive impact of consolidation.

A Review of FMCSA's Regulatory Evaluation for the Proposed Minimum Training Requirements for Entry-Level Commercial Motor Vehicle Operators. Analysis of the U.S. Department of Transportation's proposed regulation regarding the minimum training requirements for truck and bus drivers.

Separable Costs–Remaining Benefits calculation for a dam reconstruction project. Report on cost allocation for a municipal water district which assessed the relative benefits and costs of recreational and water-supply uses of a reservoir.

Peer review for U.S. EPA STAR Grant program. Peer review of grant applications to the EPA's National Center for Environmental Research. Provided expertise in the areas of environmental economics, statistics, and policy analysis.

Evaluation of potential Natural Resource Damage liabilities at current and former aerospace manufacturing sites. Estimated the potential costs associated with NRD liabilities at contaminated sites for an aerospace manufacturer, for use in negotiations with insurance carriers.

Non-compete valuation for real estate executives. Assessment of the value of non-compete agreements for two senior executives at a real estate management firm.

Evaluation of Natural Resource Damage liabilities at an operational mining site. Report on the potential litigation and regulatory risk associated with environmental damages at an operational mining site, including estimates of cost, probability, and timing.

Economic impact report for entertainment-related industry. Analysis of the economic impact of an entertainment-related industry on the economies of four states, including the impact of content-generation, distribution, and retail sales on employment, output, and tax revenue.

The Past, Present, and Future Socioeconomic Effects of the Niagara Power Project. Analysis of the economic impact of a hydro-electric facility on the local and regional economies, demographics, industry, and real estate as part of a supplemental environmental impact statement for re-licensing.

PUBLICATIONS

"EPA Enforcement of the Renewable Fuel Standard Program," *Agriculture and Food Committee Newsletter*, American Bar Association, Section of Antitrust Law, v. 4, n. 1, Fall 2013.

"An Economic Perspective on Food Labeling Cases," in *Intellectual Property Law360*, May 30, 2013.

"Empirical Evidence and Class Certification in Labor Market Antitrust Cases," 25 *Antitrust* 1 (2010), co-authored with John Johnson and Paul Torelli.

"Economic Approaches to Royalty Calculations," in *Intellectual Property Law360*, May 25, 2010, co-authored with Kara Gorski.

"Intellectual Property Rights in Developing Nations," research paper for NERA Economic Consulting, prepared for the International Intellectual Property Institute (2008), co-authored with Sourav Chatterjee, Fei Deng, Christian Dippon, and Mario Lopez.

"Commercial Success: Economic Principles Applied to Patent Litigation," in Economic Approaches to Intellectual Property Policy, Litigation, and Management (Gregory K. Leonard & Lauren J. Stiroh, eds. National Economic Research Associates 2005); also in Economic Damages in Intellectual Property (Daniel Slottje ed., John Wiley & Sons 2006); co-authored with Marion B. Stewart.

"Interest and Discount Rates in Intellectual Property Damages," in Economic Approaches to Intellectual Property Policy, Litigation, and Management (Gregory K. Leonard & Lauren J. Stiroh, eds. National Economic Research Associates 2005), co-authored with Christine Meyer.

"Determining Reasonable Compensation for Employee Inventions in Japan," 6 *Global Intellectual Property Asset Management Report* 9 (2004), co-authored with Satoshi Nakashima.

"Where Is the Market Failure? A Review of OSHA's Economic Analysis for Its Proposed Ergonomics Standard," 22 *Journal of Labor Research* 75 (2001), co-authored with Mark Berkman.

"Water Subsidies in Southern California, Do They Exist and Have They Contributed to Urban Sprawl?" 37 *California Western Law Review* 121 (2000), co-authored with Mark Berkman.

"The Welfare Implications of Recycled Newsprint Regulation," doctoral dissertation, Stanford University (2000).

PRESENTATIONS

"Classwide Damage Models in Misleading and False Advertising Consumer Class Actions," Strafford CLE webinar, November 2017.

"Hedonic Price Regressions in False Advertising Class Actions," webinar for The Knowledge Group: *Expert Testimony and Survey Methodology in False Advertising Cases: A 2017 Perspective*, January 2017.

"Food & Beverage Class Actions: National Trends, Best Practices, and Emerging Claims," at Perrin Conference: *Challenges Facing the Food and Beverage Industries in Complex Consumer Litigations*, Chicago, IL, April 2014.

"Clone Wars: *Abraham & Veneklasen Joint Venture v. American Quarter Horse Association*," webinar for the ABA Section of Antitrust Law, Agriculture and Food Committee, March 2014.

"Expert Data Analysis in Wage & Hours Class Actions after *Dukes, Comcast, and Brinker*," at American Conference Institute's 19th National Forum on Wage & Hour Claims and Class Actions, San Francisco, CA, September 2013.

"Food Labeling Class Actions: Economic and Legal Perspectives on the Rule 23 Predominance Requirement," Edgeworth Economics Webinar, June 2013.

"Economic Issues in Pharmaceutical Patent Litigation," at Edgeworth Economics CLE Seminar, Washington, DC, September 2010.

"The Evolution of a Complex Damages Report," at Edgeworth Economics CLE Seminar, Philadelphia, PA, April 2010.

"Economists' Views of Recent Patent Damages Decisions," at Edgeworth Economics CLE Seminar, Washington, DC, April 2010.

"When Does a Damages Expert's Analysis Cross the Daubert Line?" at the *Judicial Education Program* presented by Northwestern University School of Law, Chicago, IL, February 2009.

"Copyright Valuation and Damages Assessment," at Law Seminars International Conference: *Copyright Law Counseling, Management and Litigation*, Seattle, WA, April 2008.

"Trade Secret Valuation and Damages Assessment," at Lexis-Nexis Conference: *Trade Secret Protection: Realizing Best Practices for Trade Secret Protection*, Shanghai, China, December 2007.

"Comparables: The Use and Misuse of Benchmark Royalty Rates for Patent Damages," at NERA CLE Seminar, San Francisco, CA, January 2007.

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